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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,893	07/28/2006	Hirokazu Kugai	049677-0189	2348

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MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER	
SLIFKA, COLIN W	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
11/27/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,893	KUGAI ET AL.	
	Examiner	Art Unit	
	COLIN W. SLIFKA	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6 and 7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6 and 7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 June 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemoto et al (JP 2004-172469A) in view of Hatauchi et al (JP 2001-189211 A) and Lashmore et al (US 6,251,514).

Takemoto teaches a soft magnetism powder with an oxygen concentration content of 0.01-0.15 mass %.

Takemoto does not teach that the iron particles consist of elemental iron and iron oxide.

Lashmore, in a similar invention, teaches that when the ferromagnetic powder is used in fabricating soft magnetic material, suitable ferromagnetic particles are particles of iron or iron alloys such as Fe—Si, Fe—Al, Fe—Si—Al, Fe—Ni, Fe—Co, Fe—Co—Ni, or combinations thereof. Typically, alloys of iron have a higher permeability and lower core losses when used in a magnetic circuit when compared with pure iron. However, pure iron functions satisfactorily and provides a higher induction (high B), is softer, is easier to press to high density and is generally lower in cost (col. 5, lines 9-19).

It would have been obvious to one of ordinary skill in the art at the time of the invention to produce a magnet as taught by Takemoto with pure, elemental iron,

because it known in the art that pure iron functions satisfactorily as a material, and for the benefits of higher induction, a softer material, and it is easier to press to high density and is lower in cost, as taught by Lashmore.

Takemoto does not teach a specific coercive force.

Hatauchi teaches an iron dust core with a coercive force of less than 80 A/m. Hatauchi does not recognize oxygen as being present in the dust core metallic alloy therefore it is considered to have a concentration of zero or at most as a level of impurity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the dust core of Takemoto with a low coercive force as taught by Hatauchi for the purpose of providing excellent resistance and current loss properties to the dust core.

Takemoto does not teach insulating coated films on the magnetic particles.

Lashmore clearly teaches producing an oxide/phosphate coating with phosphoric acid (col. 9, lines 52-54), and that the coating provides insulation, which is intended to keep eddy current losses low (col. 1, lines 61-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the particles with an oxide/phosphate coating as taught by Lashmore to insulate the magnetic materials taught by Takemoto and keep eddy current losses low.

The claimed “oxide that is formed by subjecting the metal magnetic particles to phosphoric acid treatment” is a product by process limitation, and there is nothing in the

applicant's disclosure showing either structural limitations of the oxide that are particular to the claimed phosphoric acid treatment, or any other reasons limiting the oxide to the claimed method of making. Therefore, the fact that the oxide is formed by “subjecting the metal magnetic particles to phosphoric acid treatment” does not distinguish the claimed insulating coating film from the coating taught by Lashmore.

Regarding claims 3 and 4, Takemoto includes a table that includes particle sizes within the limitations of claims 3 and 4.

Regarding claim 6, in addition to the teachings of Hatauchi above, Takemoto teaches a powder magnetic core.

Claims 1, 3, 4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al (US 5,800,636) in view of Takemoto et al (JP 2004-172469A), Hatauchi et al (JP 2001-189211 A), and Lashmore et al (US 6,251,514).

Tsukada teaches "a dust core consisting essentially of iron powder particles with a particle size of 75 to 200 μm…and 300-2,500 ppm of oxygen (Abstract).” Tsukada teaches that the “dust core preferably has an oxygen content of 300 to 2,500 ppm (col. 11, lines 32-33),” which converts to 0.03 to 0.25 wt%.

The lower limitation of 0.03 wt%, as taught by Tsukada, is just outside the amended limitation of "less than 0.03% by mass," in the instant claim 1.

Takemoto teaches a soft magnetism powder with an oxygen concentration content of 0.01-0.15 mass %, and that as the oxygen density in the powder rises, the coercive force of the powder magnetic core becomes large, and causes increase of

hysteresis loss, and the powder with a high oxygen density becomes unsuitable as a raw material of the powder magnetic core of low core loss (par. 9, lines 6-9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to produce a dust core of the invention of Tsukada with a lower oxygen content, as Takemoto teaches that the lower oxygen contents benefit coercive force and provide a better suited raw material for the dust core.

Tsukada does not teach that the iron particles consist of elemental iron and iron oxide.

Lashmore, in a similar invention, teaches that when the ferromagnetic powder is used in fabricating soft magnetic material, suitable ferromagnetic particles are particles of iron or iron alloys such as Fe—Si, Fe—Al, Fe—Si—Al, Fe—Ni, Fe—Co, Fe—Co—Ni, or combinations thereof. Typically, alloys of iron have a higher permeability and lower core losses when used in a magnetic circuit when compared with pure iron. However, pure iron functions satisfactorily and provides a higher induction (high B), is softer, is easier to press to high density and is generally lower in cost (col. 5, lines 9-19).

It would have been obvious to one of ordinary skill in the art at the time of the invention to produce a magnet as taught by Tsukada as combined with Takemoto with pure, elemental iron, because it known in the art that pure iron functions satisfactorily as a material, and for the benefits of higher induction, a softer material, and it is easier to press to high density and is lower in cost, as taught by Lashmore.

Tsukada does not teach a specific coercive force.

Hatauchi teaches an iron dust core with a coercive force of less than 80 A/m. Hatauchi does not recognize oxygen as being present in the dust core metallic alloy therefore it is considered to have a concentration of zero or at most as a level of impurity.

It would have been obvious to one of ordinary skill in the art at the time of the invention to form the dust core of Tsukada with a low coercive force as taught by Hatauchi for the purpose of providing excellent resistance and current loss properties to the dust core.

Tsukada teaches that the "iron particles bear on their surface a binder layer" to provide insulation (col. 9, lines 60-61).

Tsukada does not teach that binding layer is an oxide.

Lashmore clearly teaches producing an oxide/phosphate coating with phosphoric acid (col. 9, lines 52-54), and that the coating provides insulation, which is intended to keep eddy current losses low (col. 1, lines 61-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the particles with an oxide/phosphate coating as taught by Lashmore to insulate the magnetic materials taught by Tsukada and keep eddy current losses low.

The claimed "oxide that is formed by subjecting the metal magnetic particles to phosphoric acid treatment" is a product by process limitation, and there is nothing in the applicant's disclosure showing either structural limitations of the oxide that are particular to the claimed phosphoric acid treatment, or any other reasons limiting the oxide to the

claimed method of making. Therefore, the fact that the oxide is formed by “subjecting the metal magnetic particles to phosphoric acid treatment” does not distinguish the claimed insulating coating film from the coating taught by Lashmore.

Regarding claims 3 and 4, Tsukada teaches that "the iron powder consists of particles having a particle size of 75 to 200 μm, more preferable 125 to 180 μm (col. 6, lines 26-28).”

Response to Arguments

Applicant's arguments filed July 10, 2009 have been fully considered but they are not persuasive. Applicant argues that the magnetic material of Takemoto includes other elements such as Al or Si or the like, and that aluminum oxide or silicon oxide would be produced inside of the iron alloy. The instant claims do not limit the presence of additional elements. Rather, only the “iron particles” are limited to elemental iron and iron oxide. Examiner does not consider the silicon or aluminum particles to be “iron particles," as claimed. Furthermore, it is noted that the magnetic material of the instant invention includes carbon, phosphorous, and sulfur as seen in Table 1. Furthermore, the teachings of Lashmore show that such magnets are commonly formed of iron or iron alloys.

Regardless of Takemoto, as stated both above and in the previous action, Tsukada teaches that the oxygen may be present as low as 0.03 wt%. 0.03 wt % is substantially close to "less than 0.03 wt %" (i.e. 2.999...). One of ordinary skill would

have expected compositions that are in such close proportions to those in the prior art to be prima facie obvious, and to have the same properties.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLIN W. SLIFKA whose telephone number is (571)270-5830. The examiner can normally be reached on Monday-Thursday, 10:00AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLIN W SLIFKA/
Examiner, Art Unit 1793

November 17, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793